



U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: **AIR-TO-GROUND RADIO CONTROL
OF AIRPORT LIGHTING SYSTEMS**

Date: **3/4/86**
Initiated by: **AM-200**

AC No: **150/5340-27A**
Change:

1. PURPOSE. This advisory circular (**AC**) contains the Federal Aviation Administration (FAA) standard operating configurations for **air-to-ground** radio control of airport lighting systems.
2. CANCELLATION. AC **150/5340-27**, Air-To-Ground Radio Control of Airport Lighting Systems, dated August 10, 1977, is cancelled.
3. APPLICATION. The standards contained herein are recommended by the **FAA** in all applications involving airport development of this nature. The standards are mandatory for projects funded under the Airport Improvement Program or at locations where air-to-ground radio is **used** to control airport lighting systems associated with instrument approach procedures.
4. GENERAL. Air-to-ground radio control may be used to turn on and adjust the intensity of airport lighting systems by clicking the aircraft radio microphone. This system permits a pilot to select the light intensity of his choice while minimizing power consumption when the runway is not in use. The airport operator should review the operating configurations described in this circular and implement the ones which gives the pilot the greatest possible utilization of the airport lighting systems while keeping operating expenses at a minimum.
5. RESTRICTIONS ON USE OF RADIO CONTROL. Air-to-ground radio control may be used at uncontrolled airports or at controlled airports during periods when the air traffic control tower is closed. Obstruction lights and **the** airport beacon may not be radio controlled. All other lighting systems on the airport may be operated by air-to-ground radio control.
6. RADIO CONTROL EQUIPMENT
 - a. Operation. The air-to-ground radio control equipment permits the pilot to turn on the airfield lights and select any one of the available intensity steps (normally three). The intensity is selected by keying **the** microphone of **the** aircraft communication transmitter **a** prescribed number of times in **a** S-second interval. Keying the microphone three times selects **the lowest** intensity; five times selects a medium intensity; and seven times selects **the highest** intensity. Once energized, the lights will stay on for 15 minutes. At the end of the **15-minute** cycle, the lights will be either turned off or returned to a preset

brightness depending on the selected operating mode. The system may be recycled at any time for another 15 minute period at any intensity **step desired by** keying the microphone the appropriate number of times. Except for Runway End Identifier Lights (REILS) with 1 or 2 steps, the lighting systems may not be turned off by radio control before the end of the 15-minute cycle.

b. Frequency. The radio control is tuned to a single frequency in the range of 118-136 MHz, which is assigned as described in paragraph 8a. Whenever possible, the Common Traffic Advisory Frequency (CTAF) is used for radio control of airport lighting. The CTAF may be UNICOM, MULTICOM, FSS, or tower frequency and will be identified in appropriate aeronautical publications.

c. FAA-Owned Radio Controls. At some airports, the FM may own and maintain an air-to-ground radio control which operates FM-owned approach light systems, Precision Approach Path Indicators (PAPI's), or Visual Approach Slope Indicators (VASI's). This radio control may not be used to control airport-owned lighting systems. If a second radio control is installed to operate the airport's lighting systems, it shall operate on the same frequency as the FAA unit.

d. Equipment. Specifications for radio control equipment are given in AC 150/5345-49, Specification for L-854, Radio Control Equipment, current edition, and may be obtained from the Department of Transportation, Subsequent Distribution Unit, M-494.3, Washington, D.C. 20590.

7. INTERFACING THE RADIO CONTROL WITH THE LIGHTING SYSTEMS. The output of a single airport-owned radio controller is usually connected to the control inputs of several lighting systems. The radio controller may be directly connected to the lighting systems, or an interface box may be used to reduce the load on the radio controller's output relays or to allow additional switching capabilities. The following paragraphs discuss the design considerations when interfacing a radio control with several lighting systems.

a. Standard System Configurations. The radio control system should be configured so that the runway lights are on whenever the other lighting systems serving the runway are on (except during day operations--see paragraph 7d). When a runway has approach lights which are radio controlled and edge lights which are not, then the edge lights are left on at a brightness selected according to the anticipated weather conditions during the hours of night operation. If the runway lights are radio controlled and the approach lights are not, then the approach lights may be left off or at a preselected brightness. The approach lights should never be on while the runway lights are off.

b. Intensity Control.

(1) Linking of Approach Lights and Edge Lights. On runways where the approach lights and the runway lights are both radio controlled, the intensities of both systems are increased or decreased simultaneously by the radio control.

(2) Selection of Intensity Settings. While the radio control equipment is equipped with three intensity settings, airport lighting systems may have one,

two, three, or five intensity steps. Table 1 gives guidance on how to interface the radio control with the intensity steps of the airport lighting system. For example, a lighting system with five intensity steps would be connected so that three clicks of the microphone would energize brightness step 1 or 2, five clicks would energize step 3, and seven clicks would energize step 5. The airport authority may select either step 1 or 2 for the lowest brightness setting, depending on the background lighting at the airport.

(3) Systems with Automatic Intensity Control. On systems where the intensity is automatically controlled by a photocell or other means, the radio control will simply energize the system and the intensity will be selected automatically by the photocell.

(4) REILS. REIL systems may have one, two, or three intensity steps and may vary widely in brightness at full intensity. The radio control of REILS should be tailored to the equipment used and the needs of the facility. For one or two step REILS, the common practice is to have the REILS off at the lower intensities and energized at the higher intensities.

c. Idle Setting. When air-to-ground radio control is used at night, the lighting system may not be energized for long periods of time. During these "idle" periods, the airport beacon, obstruction lights, and any other lighting systems which are not radio controlled will continue to operate while the radio-controlled systems are off. As an option, the runway edge lights may be left on a low intensity step. (The step selected will depend on local conditions.) If the runway lights are left on during idle periods, other lighting systems may also be left on at a preselected intensity.

d. Radio Control for Day Operations. Since the runway and taxiway edge lights, approach lights, lighted taxiway signs, and wind cones are not normally needed during the day (except during restricted visibility conditions), the radio control system may be configured with a day mode that energizes only those lighting systems which are useful during the day. Using this control mode, however, means that daytime IFR procedures associated with the deactivated lighting systems may not be used. The day mode may be selected automatically by means of a photocell or manually by use of a switch. In areas with heavy voice traffic on the frequency used by the radio controller, there may be nuisance activation due to three random microphone clicks in a S-second period. If this is a problem, the three click setting on the radio control should be bypassed for daytime use.

e. Interface Box. Other control devices, such as interlocks, photocells, and switches, may be used to provide flexibility of the radio control system under differing operational conditions. These devices are not included as part of the FM L-854 air-to-ground radio controller and must be procured separately and installed in an appropriate interface panel or box. For runways with lighting systems on both ends of a runway or at airports with more than one runway, it may be desirable to incorporate a manual switching system to allow the airport operator to choose which lighting systems will be energized by the radio control. This will permit the pilot to activate only those lighting systems which serve the

Table 1. Interface of radio control with airport visual aids.

Lighting System	Number of intensity steps	Status during idle periods*	Intensity step selected per no. of microphone clicks		
			3 clicks	5 clicks	7 clicks
Approach Lights	2	Off	Low	Low	High
	3	Off	Low	Medium	High
	5	Off	1 or 2	3	5
Edge Lights					
Low Intensity	1	Off	on	On	On
Medium Intensity	3	Off or Low	Low	Medium	High
High Intensity	5	Off or Low	1 or 2	3	5
Taxiway Edge Lights	1	Off	on	On	On
	2	Off	Low	Low	High
	3	Off	Low	Medium	High
Runway Centerline, Touchdown Zone Lgt	5	Off	1 or 2	3	5
Taxiway Centerline Lights	3	Off	Low	Medium	High
	5	Off	1 or 2	3	5
REILS	1	Off	Off	Off	On
	2	Off	Off	Low	High
	3	Off	Low	Medium	High
Visual Glideslope Systems	Photocell Control	Off	on	On	On
	3	Off	Low	Medium	High
	5	Off	1 or 2	3	5

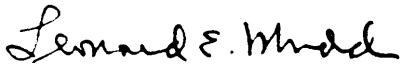
* If the runway lights are left on during idle periods, other lighting systems may also be left on at a preselected brightness.

bring active runway end and taxiways. For example, it is unnecessary to activate the at VASI's and approach light systems serving both ends of the runway at the same time.

8. COORDINATION WITH FM.

a. Frequency Selection. Assignment of a radio control frequency in the 118-136 MHz range must be obtained from the regional FM Frequency Management Officer, Airways Facilities Division, prior to ordering the radio control equipment.

b. Data Reporting. At least 90 days prior to implementing new or retrofitting existing radio control systems, information concerning the use of the system must be reported to the FM for publication in appropriate documents. Information to be reported includes airport name, city or state, sponsor, facilities controlled, runway(s), frequency, and hours of operation. Any special operating features should also be described. This data may be reported to the nearest FM Flight Service Station or directly to the FM National Flight Data Center, ATO-250, Washington, D.C. 20591.



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